

SECTION 1 - IDENTIFICATION

1.1 Product identifier

Product name: **CICLOHEXANO**

Product Identifier:

1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: Solvent.

1.3 Details of the supplier of the Safety Data Sheet

YPF S.A.

Macacha Güemes n° 515, (C1106BKK) Puerto Madero, Ciudad Autónoma de Buenos Aires, Argentina.
P: +54 11 5441 2000. F: +54 11 5441 5796.

1.4 Emergency telephone number

Emergency phone (24 hours): CIQUIME 0800 222 2933 (from Argentina)
+54 11 4552 8747 (other countries)

SECTION 2 – HAZARD IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to the Globally Harmonized System

Flammable liquids (Category 2)

Skin irritation (Category 2)

Specific target organ toxicity – single exposure (Category 3)

Aspiration hazard (Category 1)

Short-term (acute) aquatic hazard (Category 1)

Long-term (chronic) aquatic hazard (Category 1)

2.2 Label elements

Pictogram:



Signal word:

DANGER

Hazard statements:

H225 - Highly flammable liquid and vapour.

H304 - May be fatal if swallowed and enters airways.

H315 - Causes skin irritation.

H336 - May cause drowsiness or dizziness.

H400 + H410 - Very toxic to aquatic life with long lasting effects.

Precautionary statements:

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P260 - Do not breathe fume, mist, vapours or spray.

P271 - Use only outdoors or in a well-ventilated area.

P273 - Avoid release to the environment.

P280 - Wear protective gloves.

P301 + P330 + P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.

P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P362 + P364 - Take off contaminated clothing and wash it before reuse.

P370 + P378 - IN CASE OF FIRE: Use water spray, foam, dry chemical or carbon dioxide to extinguish.

P391 - Collect spillage.

P403 + P235 - Store in a well-ventilated place. Keep cool.

P405 - Store locked up.

P501 - Dispose of contents and/or container in accordance with national and international regulations.

2.3 Other hazards

There are no other additional hazards of consideration in the classification.

SECTION 3 - COMPOSITION / INFORMATION ON INGREDIENTS**3.1 Substance**

Cyclohexane (CAS 110-82-7): 100% - Flam. Liquid 2; Asp. Tox. 1; Skin Irrit. 2; STOT Single Exp. 3; Aquatic Acute 1; Aquatic Chronic 1

3.2 Mixtures

Does not apply.

SECTION 4 – FIRST-AID MEASURES**4.1 Description of first aid measures**

General advice:	Avoid exposure to the product and take appropriate protective measures. Consult your doctor with the safety data sheet.
Inhalation:	Move victim to an area with clean air. Keep her at rest. If not breathing, apply CPR. Call the doctor.
Skin contact:	Immediately wash skin with plenty of soap and water for at least 15 minutes.
Eye contact:	Immediately flush eyes with water for at least 15 minutes, keeping eyelids open. If you have contact lenses, remove them after 5 minutes and continue rinsing eyes. Consult the doctor.

Ingestion: DO NOT INDUCE VOMITING. Rinse mouth with water. If the victim is unconscious, call a doctor immediately, and turn her on her side to reduce the risk of aspiration. Do not give the victim anything to drink or eat.

4.2 Most important symptoms and effects, both acute and delayed

Inhalation: may cause dizziness, drowsiness, and central nervous system depression.

Skin contact: may cause irritation and dermatitis on prolonged skin contact.

Eye contact: may cause eye irritation.

Ingestion: may cause nausea, vomiting and stomach upset.

4.3 Indication of any immediate medical attention and special treatment needed

Medical advice: Perform symptomatic treatment. For more information, consult a Poison Center.

SECTION 5 – FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Use dry chemical, foam (may be required AR-foam), water spray or CO₂. DO NOT USE water jets as it may spread fire.

5.2 Special hazards arising from the substance or mixture

HIGHLY FLAMMABLE. The material can accumulate static charges that can produce an electrical discharge that can cause fire.

Container and/or tank subjected to heat may unexpectedly explode and project dangerous fragments. Vapors are heavier than air and may spread along floors.

5.3 Advice for firefighters

5.3.1 Firefighting instructions

Spray containers and/or tanks with water to keep them cool.

Continue cooling with water after fire is out.

Prevent water used for fire control from entering watercourses, drains or springs.

Hot material can cause violent boiling when in contact with water, being able to project and cause serious burns.

5.3.2 Protective clothing

Use SCBA and structural protection clothing for firefighters.

5.3.3 Hazardous combustion products

In case of fire, it may release irritating and/or toxic fumes and gases, such as carbon monoxide, and other substances derived from incomplete combustion.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment, and emergency procedures

6.1.1 For non-emergency personnel

Evacuate personnel to a ventilated area.

6.1.2 For emergency responders

Wear positive pressure self-contained breathing apparatus and fire-fighting protective clothing (includes fire-fighting helmet, jacket, pants, boots, and gloves). Avoid contact with the product during operations.

For non-fire spills or post-fire cleanup phase, wear chemical protective clothing specifically recommended by the manufacturer.

Eliminate all sources of ignition (no smoking, flares, sparks or open flames in danger area). Ground all equipment used to handle the product. Stop leak if you can do it without risk. Do not touch contaminated objects or areas or walk on the spilled material. You can use foam to reduce the emission of vapors. Do not allow reuse of spilled product.

6.2 Environmental precautions

Contain spilled liquid with a dam or barrier. Prevent entry into navigable waterways, sewers, basements or uncontrolled confined areas.

6.3 Methods and material for containment and cleaning up

Contain and recover the liquid when possible. Collect the liquid product with sand, vermiculite, earth, or inert absorbent material and then completely clean the affected area. Dispose of the waste properly. Dispose of the water and collected waste in marked containers for disposal as waste.

6.4 Reference to other sections

See Section 8 - Exposure Controls and Personal Protection, and Section 13 – Disposal considerations.

SECTION 7 – HANDLING AND STORAGE

7.1 Precautions for safe handling

Do not eat, drink or smoke during handling. Avoid contact with eyes, skin and clothing. Wash arms, hands, and nails after handling. Facilitate access to safety showers and eyewash emergency.

Use equipment and clothing that prevents the accumulation of electrostatic charges. Monitor and avoid explosive atmosphere formation.

7.2 Conditions for safe storage, including any incompatibilities

Store in a clean, dry, well-ventilated area. Protect from sunlight. Containers, even those that have been emptied, may contain vapors. Do not cut, drill, grind, weld or perform similar operations on or near empty containers.

Packaging materials: Supplied by the manufacturer.

Incompatibilities: Keep away from Oxidizing mineral acids, strong oxidizing agents.

7.3 Specific end use(s)

Solvent.

SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

TLV-TWA (ACGIH):	100 ppm [2020]
TLV-STEL (ACGIH):	N/D
PEL (OSHA):	300 ppm
REL:	300 ppm
IDLH (NIOSH):	1300 ppm

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Keep workplace ventilated. The normal routine ventilation is usually adequate. Local hoods should be used for operations that produce or release large amounts of product. In low or confined areas should be provided mechanical ventilation. Provide showers and eyewash stations.

8.2.2. Individual protection measures, such as personal protective equipment

Eye and face protection:	When necessary, wear safety glasses complying with EN 166.
Skin protection:	When necessary, wear impermeable protective LLDPE, nitrile, PVA or Viton - do not use butyl, rubber, neoprene or PVC - gloves (complying with standards EN 374), clothes and safety footwear resistant to chemicals.
Respiratory protection:	When necessary, wear an organic gas or steam (A) respirator. Special attention to oxygen levels in the air should be paid.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance:	Liquid.
Colour:	Colourless.
Odour:	Pungent.
Odour threshold:	N/D
pH:	N/D
Melting point:	6,5°C (44°F)
Boiling point:	81°C (178°F)
Evaporation rate:	2,6 (diethylether = 1)
Flammability:	The product is flammable.
Flash point:	-18°C (0°F) c.c.

Explosive limits:	1,3% - 8,3%
Auto-ignition temperature:	N/D
Decomposition temperature:	N/D
Vapour pressure (25°C):	96,6 mmHg
Vapour density (air=1):	2,98
Relative density (20°C):	0,78 g/cm ³
Solubility (20°C):	Insoluble in water.
Partition coefficient (logKo/w):	3,44
Viscosity (20°C):	1,26 cP
Henry constant (20°C):	N/D
Explosive properties:	Not explosive. This study is not required because in the molecule no chemical groups are associated with explosive properties.
Oxidizing properties:	This study is not necessary because the substances present in the product, due to their chemical structures, are incapable of reacting exothermically with combustible materials.

9.2 Other information

Other properties: None.

SECTION 10 – STABILITY AND REACTIVITY

10.1. Reactivity

It is not expected that product reactions or decomposition may occur under normal storage conditions. It does not contain organic peroxides. It is not corrosive to metals. It does not react with water.

10.2. Chemical stability

The product is chemically stable and it does not require stabilizers.

10.3. Possibility of hazardous reactions

No hazardous polymerization is expected.

10.4. Conditions to avoid

Avoid high temperatures, open flames, sparks and other sources of ignition.

10.5. Incompatible materials

Keep away from Oxidizing mineral acids, strong oxidizing agents.

10.6. Hazardous decomposition products

When heated, it may release toxic and irritating vapors. In case of fire, see section 5.

SECTION 11 – TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity:

Bibliographic data are presented for reference.

LD50 oral (bibl.): > 5000 mg/kg

LD50 der (bibl.): 2000 mg/kg

LC50 inh. (4 hs., bibl.): > 5 mg/l

Skin irr. (rabbit, bibl.): irritant

Eye irr. (rabbit, bibl.): not irritant

Skin sens (Guinea pig, bibl.): not sensitizing

Resp. sens (Guinea pig, bibl.): not sensitizing

Carcinogenicity, mutagenicity, reproductive toxicity and other effects:

Carcinogenicity: Not classified as carcinogenic according to the GHS.

Mutagenicity: Not classified as mutagenic according to the GHS.

Tox. Repr.: Not classified as toxic for reproduction according to the GHS with effects on sexual function and fertility.

Teratogenicity: It is not classified as toxic for reproduction according to the GHS with effects on the development of offspring.

STOT-SE: May cause narcotic effects, with drowsiness, dizziness and vertigo.

STOT-RE: Not classified as target organ toxic after prolonged or repeated exposure according to the GHS.

Aspiration: The product is toxic by aspiration and the viscosity makes its incorporation possible by this route, which is why it is classified as dangerous by aspiration.

Acute and delayed effects:

Routes of exposure: Inhalation, skin and eye contact.

Inhalation: may cause dizziness, drowsiness, and central nervous system depression.

Skin contact: may cause irritation and dermatitis on prolonged skin contact.

Eye contact: may cause eye irritation.

Ingestion: may cause nausea, vomiting and stomach upset.

SECTION 12 – ECOLOGICAL INFORMATION

12.1. Toxicity

Bibliographic data of its component are presented for reference.

EC50 (fish, 96 h): 4,53 mg/l

EC50 (inv., bibl., 48 h): 0,9 mg/l

EC50 (algae, bibl., 72 h): 3,4 mg/l

NOEC (fish, 14 d): 0,02 mg/l

NOEC (inv., bibl., 14 d): 0,02 mg/l

PNEC (water): 0,207 mg/l (F=1)

PNEC (sea): 0,207 mg/l (F=1)

PNEC-STP: 3,24 mg/l (F=1)

12.2. Persistence and degradability

BIODEGRADABILITY (OECD): The product is readily biodegradable.

12.3. Bioaccumulative potential

Log K_{ow} : 3,44

BIOCONCENTRATION FACTOR - BCF (OCDE 305): 31 to 102 -It suggests that the potential for bioconcentration in aquatic organisms is low to moderate.

12.4. Mobility in soil

HENRY CONSTANT (20°C): N/D

LogKoc: 2,89 .

12.5. Results of PBT and vPvB assessment

This product does not meet the PBT criteria of Annex XIII of REACH. This product does not meet the vPvB criteria in Annex XIII of REACH.

12.6. Other adverse effects

AOX and metal containing: Does not contain organic halogens nor metals.

SECTION 13 – DISPOSAL CONSIDERATIONS

Dispose of excess product and empty containers according to current legislation for the protection of the environment and hazardous waste. Disposal procedure: incineration.

SECTION 14 – TRANSPORT INFORMATION

14.1 Transport by land

Proper Shipping Name:	CYCLOHEXANE
UN/ID Number:	1145
Hazard class:	3
Packing group:	II
Hazard identification number:	33
Excepted and limited quantity:	333 / 1 L
Special provisions:	-



14.2 Air transport (ICAO/IATA)

Proper Shipping Name:	CYCLOHEXANE
UN/ID Number:	1145
Hazard class:	3
Packing group:	II
PAX and Cargo Packing instructions:	Y341; 1 L / 353; 5 L
Cargo Packing instructions:	364; 60 L



ERC: 3H
Special provisions: -

14.3 Sea transport (IMO)

IMDG Code

Proper Shipping Name: CYCLOHEXANE

UN/ID N°: 1145

Hazard class: 3

Packing group: II

EMS: F-E, S-D

Stowage and manipulation: Category E

Segregation: -

Marine pollutant: YES

Proper Shipping Name: UN1145; CYCLOHEXANE; Class 3; PG II; MARINE POLLUTANT; Flash point -18°C (0°F) c.c.



SECTION 15 – REGULATORY INFORMATION

Not dangerous for the ozone layer.

Volatile organic compounds (VOC's): N/D

NFPA: 2 3 0 - EPP: G

Regulation

Globally Harmonized System of Classification and Labelling of Chemicals, fifth revised edition, 2013 (GHS 2013 - 'ST / SG / AC 10/30 / Rev.5'). The fifth edition is taken into consideration because it is the one valid for Argentina according to Resolution 801/2015 of the SRT. In any case, the information is contrasted with Revision 7 ('ST / SG / AC 10/30 / Rev.7') and clarification is made if required.

Agreement on Transport of Dangerous Products within the MERCOSUR, MERCOSUR\CMC\DEC N° 2/94.

European Agreement on the International Carriage of Dangerous Goods by Road (ADR 2023) and amendments.

Regulations concerning the International Carriage of Dangerous Goods by Rail (RID 2023) and amendments.

International Maritime Dangerous Goods Code (IMDG 2020 - Amendment 41-22), International Maritime Organization (IMO).

Regulations of the International Air Transport Association (IATA 64 ed., 2023) on the transport of dangerous goods by air.

SECTION 16 – OTHER INFORMATION

16.1 Abbreviations and acronyms

N/A: not applicable.

N/D: no data available.

CAS: Chemical Abstracts Service

IARC: International Agency for Research on Cancer

ACGIH: American Conference of Governmental Industrial Hygienists.

TLV: Threshold Limit Value

TWA: Time Weighted Average

STEL: Short Term Exposure

REL: Recommended Exposure Limit.
PEL: Permissible Exposure Limit.
INSHT: National Institute for Safety and Health at Work.
ATE: Acute toxicity estimate.
LD50: Lethal Dose.
LC50: Lethal Concentration.
EC50: Average Effective Concentration.
IC50: Inhibitory Concentration Medium.

DENOMINATION OF GHS CLASSES

Aer.: aerosols
Oxid. Gas: oxidizing gas
Compressed gas: compressed gas
Dissolved gas: dissolved gas
Flam. Gas: flammable gas
Liquefied Refr. Gas: refrigerated liquefied gas
Liquefied gas: liquefied gas
Oxid. Liquid: oxidizing liquid
Flam. Liquid: flammable liquid
Pyr. Liq.: pyrophoric liquid
Met. Corr.: corrosive for metals
Org. Perox.: organic peroxide

Water React. Flam. Gas: substance reactive with water, which emits flammable gases
Oxid. Solid: oxidizing solid
Flam. Solid: flammable solid
Asp Tox.: aspiration toxicity
Carc.: carcinogenicity
Skin Corr. / Irrit.: Corrosion / skin irritation
Eye Damage / Irrit. : Serious eye damage / eye irritation
Lac.: toxic for reproduction - lactation
Muta.: mutagenicity
Repr.: toxic for reproduction
Skin Sens.: skin sensitizer
Resp. Sens.: respiratory sensitizer
STOT Rep. Exp.: Specific target organ toxicity - repeated exposure
STOT Single Exp.: Specific target organ toxicity - single exposure
Acute Tox.: Acute toxicity
Aquatic Acute: Hazardous to the aquatic environment - acute danger
Aquatic Chronic: Dangerous for the aquatic environment - chronic danger
Ozo.: Dangerous for the ozone layer.

16.2 Key literature references and sources for data

International Agency for Research on Cancer (IARC), classification of carcinogens.
Hazard Classification and Labeling of Petroleum Substances in the European Economic Area – 2020, CONCAWE, Brussels, October 2020
European Chemicals Agency – ECHA
GESTIS-Stoffdatenbank, IFA, DGUV, Germany
Annex VI of Regulation (EC) No. 1272/2008, on classification, labeling and packaging of substances and mixtures (CLP Regulation)
US National Library of Medicine - PUBCHEM
eChem Portal, OECD

16.3 Classification and procedure used to derive the classification for mixtures

The classification was performed based on chemical analogues and product information compiled by CIQUIME.
SECTION 2: classification by hazard extrapolation and based on product data.
SECTION 9: product data.
SECTION 11 and 12: calculation of acute toxicity estimation according to GHS, product data and bibliographic data.

Change's control: v.2 - Adaptation to the GHS.

The partial or total modification of this file is not allowed, including the renown of the product, without the authorization of CIQUIME S.R.L.

16.4 Disclaimer

This information only concerns the above-mentioned product and is not to be valid for other (s) product (s) or in any process. This safety data sheet provides health and safety information. The information is to our best

knowledge, correct and complete. It is given in good faith but without warranty. The product should be used in applications consistent with our product literature. Individuals handling this product should be in-formed of the recommended safety precautions and should have access to this information. For any other use, exposure should be evaluated so that they can implement appropriate handling practices and training programs to ensure safe operations in the workplace.

It remains the user's own responsibility that this information is appropriate and complete for the special use of this product.